APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/470,741	12/20/99	JIANG	H 042390.P5700

EXAMINER

ART UNIT	PAPER NUMBER
2623	5

WM31/1010
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DATE MAILED:

10/10/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/470,741	Applicant(s) Jiang et al.	
	Examiner Jingge Wu	Art Unit 2623	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ___three___ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Dec 20, 1999* .

2a) ☐ This action is FINAL.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-34* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)

16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). __3__

18) ☐ Interview Summary (PTO-413) Paper No(s). _____

19) ☐ Notice of Informal Patent Application (PTO-152)

20) ☐ Other: _____

DETAILED ACTION

Claim Objections

1.   Claims 28-34 are objected to because of the following informalities: in claims 28 and 32,

line 2, "result in the following" should be changed to --including-- or --comprising-- . Claims 29-

31 and 33-34 depend from the claims 28 and 30, therefore, are objected. Appropriate correction

is required.

Drawings

2.   Figure 1 should be designated by a legend such as --Prior Art-- because only that which is

old is illustrated. See MPEP § 608.02(g).

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use
>
> or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United
> States before the invention thereof by the applicant for patent, or on an international application by another who
> has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention
> thereof by the applicant for patent.

4.   Claims 1-7, 9, and 16-24, are rejected under 35 U.S.C. 102(b) as being anticipated by the article "Frequency domain down-conversion of HDTV using an optimal motion compensation scheme" to Vetro et al. ("Vetro").

As to claim 1, Vetro discloses a method of performing video image decoding comprising:

downsampling (down-conversion) a compressed video image in the frequency domain (DCT domain) (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2);

inverse transforming (IDCT) the downsampled video image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2 and pages 11, section 4.3).

As to claim 16, Vetro discloses a method of performing video image decoding comprising:

inverse transforming (IDCT) the a compressed video image (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2);

downsampling (down-conversion) a compressed video image in the spatial domain (Figs. 8 and 9, scheme 2, page 9, section 4.1 and page 10, section 4.2); and

performing motion compensation for the downsampled image in the spatial domain (page Fig. 3b, page 4, section 2, and page 11, section 4.3).

As to claims 2 and 17, Vetro further discloses wherein the compressed video image in the frequency domain comprises a discrete cosine transform (DCT) image (Figs. 8 and 9, scheme 1, page 9, section 4.1 and page 10, section 4.2).

As to claims 3 and 18, Vetro further discloses the DCT image is stored as a DCT image that complies with an MPEG specification(Abstract, note that the DCT image of Vetro is inherently stored as MPEG specification because the Vetro method is to solve the drift and block artifact problems of MPEG-2).

As to claim 4, Vetro further discloses the DCT image is stored as a frame type image (Fig. 6, page 9, section 4.1).

As to claim 5, Vetro further discloses the motion compensation data signals are stored as frame prediction type motion compensation (page 11, section 4.3).

As to claim 6, Vetro further discloses the DCT image is stored as a field type image (Fig. 7, page 10, section 4.2).

As to claim 19, Vetro further discloses the DCT image comprises macroblocks stored as field macroblocks (Fig. 7 Wi (i=1-4)) and macroblocks stored as frame macroblocks (Fig. 6, Ai (i=1-4)).

As to claims 7 and 21, Vetro further discloses the motion compensation data signals are stored as field prediction type motion compensation (page 11, section 4.3).

As to claim 9, Vetro further discloses the downsampling is performed using an integer

ratio(Fig. 6, page 6, note that 16x16 DCT macroblock is down-conversion to 8x8 DCT

macroblock and the ratio is 2).

As to claim 20, Vetro further discloses converting the frame macroblocks to field

macroblocks prior to downsampling in the spatial domain (Fig. 9, scheme 2, page 10).

As to claim 22, Vetro further discloses the step of performing motion compensation

comprises scaling motion vectors in according with a downscaling ratio (Fig. 3b, page 4-5,

section 2, note that the downconversion spatial filter x is inherently of a downscaling ratio).

As to claim 23, Vetro further discloses wherein motion vector compensation comprises

implementing an interpolation operation (Fig. 3b, page 4, section 2, and page 11, section 4.3 note

that equation (1) is an interpolation operation).

As to claim 24, Vetro further discloses motion compensation scaling implementing a

bilinear interpolation operation (page 12, note that 4x4 cut with bilinear interpolation).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in

section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the

manner in which the invention was made.

6.   Claims 10-12, 28-30 and 32-34 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Vetro in view of US5262854 to Ng.

As to claim 10, Vetro further discloses downscaling the motion vector but does not

explicitly mention performing motion compensation comprises scaling motion vectors in

according with the downsampling ratio.

Ng, in an analogous environment, discloses performing motion compensation comprises

scaling motion vectors in according with the downsampling ratio (Fig. 5, col. 6 lines 1-7 note

that the two decimator has same down sampling ratio 2, i.e. 8x8 block to 4x4 block).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the scheme of Ng in the method of Vetro in order to improve the

image reconstruction accuracy (Ng, col. 6 lines 8-45, Vetro, abstract). Doing so would convert

the format of the motion vector so as to improve accuracy of image reconstruction so that the

quality of the method is improved.

As to claims 11-12, the discussions are addressed with regard to claims 22-23,

respectively.

As to claim 28, Vetro discloses elements such as downsampling in frequency domain,

inverse transforming, and motion compensation (the discussions are addressed with regard to

claims 1-3, respectively) but does not explicitly mention an article comprising: a storage

medium, having stored thereon instructions, that when execute by a platform, including the above mentioned actions.

Ng, in an analogous environment, discloses an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the controller 302, as a state machine, is inherently to have a storage medium storing the program (instructions) executed by a platform because of the programmed routines).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include the article of Ng storing the method of Vetro in programed format in order to improve the image reconstruction accuracy and thus increase flexibility of using the Vetro's method (Ng, col. 6 lines 8-45, Vetro, abstract). Doing so would convert the format of the motion vector so as to improve accuracy of image reconstruction and increase the portability of the method.

As to claims 29-30, the discussions are addressed with regard to claims 2-3, respectively.

As to claim 32, Vetro discloses elements such as downsampling in spatial domain, inverse transforming, and motion compensation (the discussions are addressed with regard to claim 16) but does not explicitly mention an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform, including the above mentioned actions.

Ng, in an analogous environment, discloses an article comprising: a storage medium, having stored thereon instructions, that when execute by a platform, result in IDCT, motion

compensating, and MPEG (Fig. 3, element 302, col. 3 line 58-col. 4 line 42, note that the

controller 302, as a state machine, is inherently to have a storage medium storing the program

(instructions) executed by a platform because of the programmed routines).

An analogous argument with regard to combining Vetro and Ng is addressed with regard

to claim 28.

As to claims 33-34, the discussions are addressed with regard to claims 2-3, respectively.

7.   Claims 14 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro in

view of the article "A fast scheme for altering resolution in the compressed domain" to Dugad et

al. ("Dugad").

As to claims 14 and 26, Vetro further discloses the downsampling comprises

implemented a linear filter (Page 5, equation 6 and 7) but does not explicitly mention the bilinear

interpolation which is well known in the art.

Dugad, in an analogous environment, discloses using the well known bilinear

interpolation scheme for downsampling (Fig. 3, page 216, section 4).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the scheme of Dugad in the method of Vetro in order to decrease

the computational burden and directly downsample in compression domain (Dugad, page 213,

section 1). Doing so would utilize the linear property of DCT transform so as to decrease the

computational time so that the efficiency of the method is improved.

8.   Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro in view of

US 6175592 to Kim ("Kim").

        Vetro does not mention displaying downsampled spatial image that appear substantially

uniform on a computer monitor.

        Kim, in an analogous environment, discloses displaying the downsampled spatial image

so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation)

that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b,

col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical

interpolation, especially for even/odd field, creates uniform downsampled image in vertical

direction).

        It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the scheme of Kim in a computer monitor in the method of Vetro

in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-27). Doing so

would create substantial uniform downsample image in raster format to display on the screen in a

computer monitor by the vertical interpolation so that the quality of the method is improved.

9.   Claim 31 is rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro and Ng in

view of Kim .

        The combination of Vetro and Ng does not mention displaying downsampled spatial

image that appear substantially uniform on a computer monitor.

Kim, in an analogous environment, discloses displaying the downsampled spatial image

so that resulting non uniform vertical spacing of data signal lines (for example, 3:1 decimation)

that appear substantially uniform on low resolution screen of a monitor (Figs. 2a, 2b, 9a, and b,

col. 2 lines 16-18, col. 7 lines 3-20, col. 16, lines 1-14, and col. 20 lines 23-64, note that vertical

interpolation, especially for even/odd field, creates uniform downsampled image in vertical

direction).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the scheme of Kim in a computer monitor in the method of Vetro

and Ng in order to enhance the quality of the decimated image (Kim, col. 20 lines 24-27). Doing

so would create substantial uniform downsample image in raster format to display on the screen

in a computer monitor by the vertical interpolation so that the quality of the method is improved.

10.   Claims 13 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vetro r

in view of US 6222550 to Rosman et al. ("Rosman").

As to claims 13 and 25, Vetro discloses bilinear interpolation but does not mention 3D

pipeline which is well known in the art.

Rosman, in an analogous environment, discloses using 3D pipeline to perform the

bilinear interpolation (Fig. 3, col. 1, lines 8-9, col. 12, lines 5-27).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the pipeline scheme of Rosman in the method of Vetro in order to

increase computing speed and performance (Rosman, col. 1 lines 38-42 and col. 11, lines 7-44).

Doing so would increase the computing speed for the bilinear interpolation by using the 3D

pipeline so that the efficiency of the method is improved.

11.   Claims 15 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over the

combination of Vetro and Dugad, further in view of US 6222550 to Rosman et al. ("Rosman").

As to claims 15 and 27, the combination Vetro and Dugad discloses bilinear interpolation

but does not mention 3D pipeline which is well known in the art.

Rosman, in an analogous environment, discloses using 3D pipeline to perform the

bilinear interpolation (Fig. 3, col. 1, lines 8-9, col. 12, lines 5-27).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to include the pipeline scheme of Rosman in the method of Vetro and Dugad

in order to increase computing speed and performance (Rosman, col. 1 lines 38-42 and col. 11,

lines 7-44). Doing so would increase the computing speed for the bilinear interpolation by using

the 3D pipeline so that the efficiency of the method is improved.

Conclusion

12.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure.

US 5801708 to Alcorn et al. discloses a method and system for using 3D pipeline for the

bilinear interpolation.

US 6249549 to Kim, US 5708732 to Merhav et al., and US 6146456 to Pearlstein et al.

disclose the methods and systems for downsampling image in spatial domain or frequency
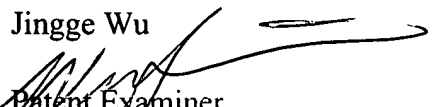
domain.

Contact Information

13.   Any inquiry concerning this communication or earlier communications should be

directed to Jingge Wu whose telephone number is (703) 308-9588. He can normally be reached

Monday through Thursday from 8:00 am to 5:30 pm. The examiner can be also reached on

second alternate Fridays.

Any inquiry of a general nature or relating to the status of this application should be

directed to TC customer service whose telephone number is (703) 306-0377.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's

supervisor, Amelia Au, can be reached at (703) 308-6604.

The Working Group Fax number is (703) 872-9314.

Jingge Wu

Patent Examiner

Art Unit 2723

October 2, 2001